Phase-1

or

Do great physics fast but with the least $

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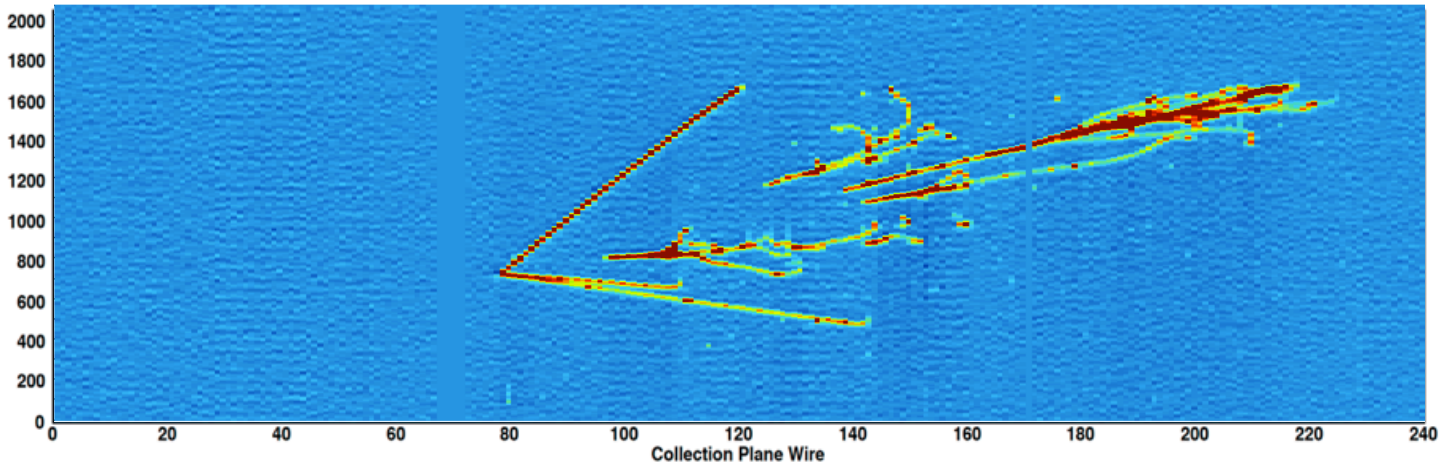
ArgoNeut ν- event with 4 photon conversions

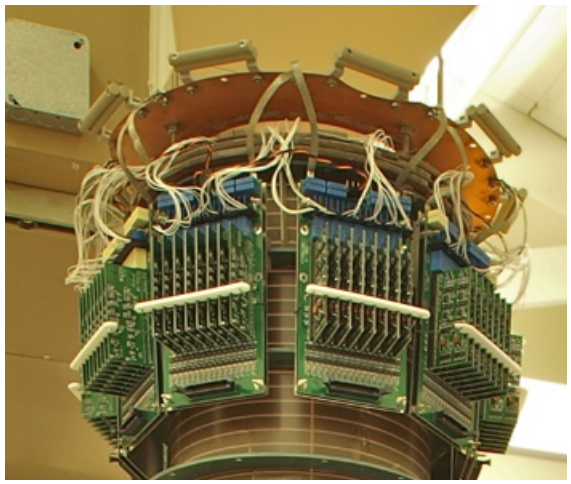


Do most possible physics, fast

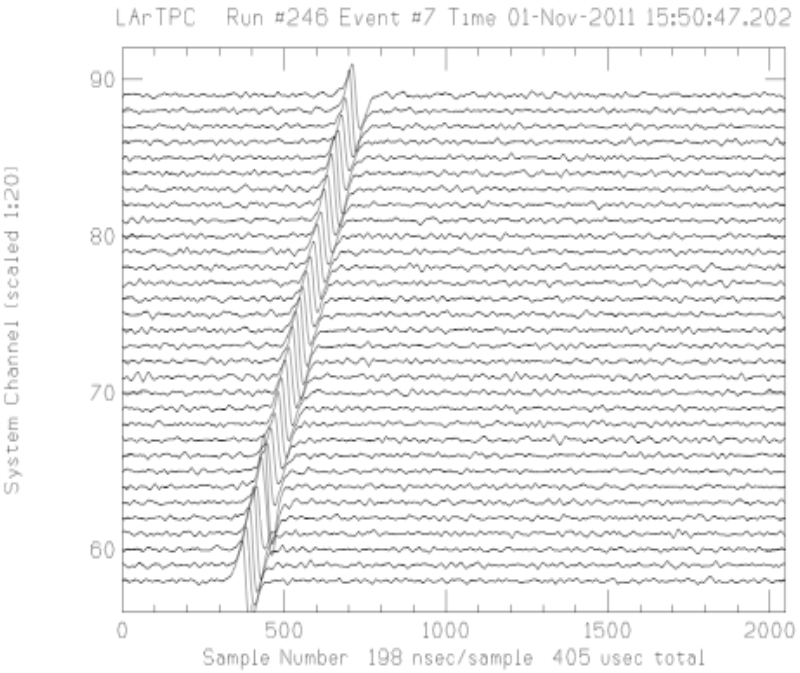
- Fast
  - Use ArgoNeut Cryostat and TPC
  - Use MSU-digitizer from ArgoNeuT
- Must do
  - Repair TPC 5-dead wires (bad card insertion ?)
  - Upgrade the cryogenics to pump LAr
  - Replace bad feedthrough with latest version
- Can do and install in < 6 months for ~ $100k,
  - Replace warm preamps with cold version from Bo
  - Improves S/N < 20 (warm), with S/N > 30 (cold)

MSU cold LArTPC electronics

- Components (Bo/Long Bo)
  - Cold CMOS preamp card with bias-V to wires
  - Cable driver, warm
  - Same ADC/digitizer: ADF2
- Ran with Bo, twice in 2011
- Long-Bo (2m), Fall 2012



Induction-plane, cosmic muon
(50cts pp, 1.6cts rms noise)



Costs for MSU cold electronics

- ArgoNeuT
  - electronics on budget and on time (~$100/ch)
  - Ran unattended for 1+ year (ex. start/stop 1 day runs)
- Bo/Long-Bo cold electronics
  - M&S for 200 ch. & protos ~$190/ch (TPC to ADF2) (includes University overhead)
- LArIAT
  - M&S for 480 channels ~$150/ch ($72,000)
  - Tech labor ~ $25,000
  - Includes: purchasing, component testing, production, board testing, install & commission
  - Commissioned in < 6 months
- Proven System – hardware/software ready for physics